INDIANA DEPARTMENT of EDUCATION

2023 INDIANA ACADEMIC STANDARDS

INTEGRATED STEM

KINDERGARTEN

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Indiana Academic Standards Context and Purpose

Introduction

The Indiana Academic Standards for Kindergarten Integrated STEM are the result of a process designed to identify, evaluate, synthesize, and create high-quality, rigorous learning expectations for Indiana students.

The Indiana Academic Standards are designed to ensure that all Indiana students, upon graduation, are prepared with essential knowledge and skills needed to access employment, enrollment, or enlistment leading to service.

What are the Indiana Academic Standards and how should they be used?

The Indiana Academic Standards are statements designed to help educators, parents, students, and community members understand the necessary content for each grade level, and within each content area domain, to access employment, enrollment, or enlistment leading to service. These standards should form the basis for strong core instruction for all students at each grade level and for each content area. The standards identify the minimum academic content or skills that Indiana students need in order to be prepared for success after graduation, but they are not an exhaustive list.

While the Indiana Academic Standards establish key expectations for knowledge and skills and should be used as the basis for curriculum, the standards by themselves do not constitute a curriculum. It is the responsibility of the local school corporation to select and formally adopt curricular tools, including textbooks and any other supplementary materials, that align with Indiana Academic Standards. Additionally, corporation and school leaders should consider the appropriate instructional sequence of the standards, as well as the length of time needed to teach each standard. Every standard has a unique place in the continuum of learning, but each standard will not require the same amount of time and attention. A deep understanding of the vertical articulation of the standards will enable educators to make the best instructional decisions. The Indiana Academic Standards must also be complemented by robust, evidence-based instructional practices to support overall student development.

What are Integrated STEM Standards?

Integrated STEM education is the purposeful integration of science, technology, engineering, and mathematics through an engaging and motivating, student-centered pedagogy and curriculum. Students are engaged in solving real-world problems using inquiry-based learning, problem-based learning, and engineering design practices, which require critical thinking and collaboration.

Indiana’s Integrated STEM Standards are intended to be embedded within instruction across content areas and courses. Implementation of Integrated STEM Standards ensures that all

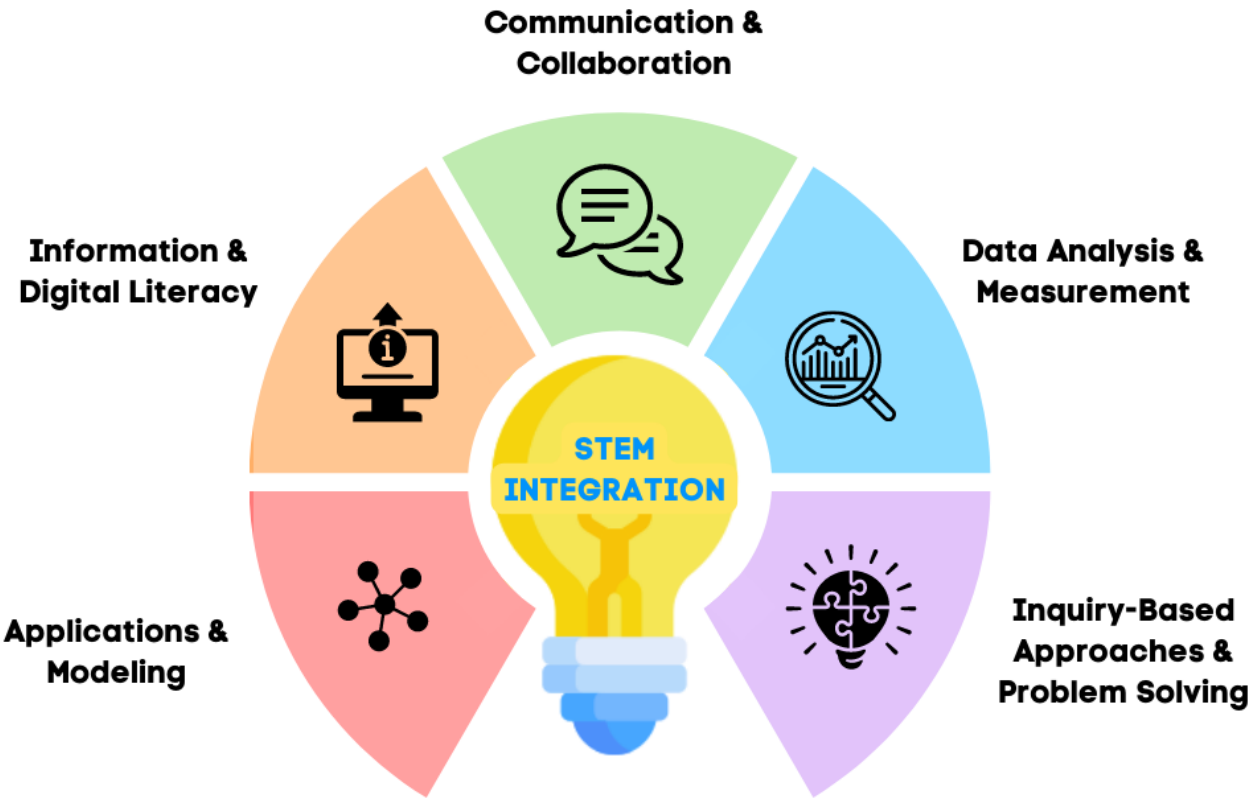
students are building skills in each of the domains throughout the school year, and should be an intentional component of instructional planning for all teachers. The standards may also be leveraged to identify appropriate work products or assessment measures to gauge student learning such as group presentations to school or community stakeholders (Communication and Collaboration), asking a question and developing a plan to move toward a solution (Inquiry-Based Approaches and Problem Solving), and developing multiple representations of data (Applications and Modeling).

The standards are intended to inform the development of a comprehensive STEM learning continuum across students' K-12 experience. Through engaging in real-world problem-solving and critical thinking, as well as a culture of collaboration and creativity, students will be prepared for life and career.

Indiana's Integrated STEM Standards outline what students should know and be able to do across the following five domains:

- **Communication and Collaboration** - Students work cooperatively to plan investigations, analyze information, and share results or conclusions using various forms of communication (e.g., writing, speaking, listening, digital).
- **Data Analysis and Measurement** - Students collect, process, and interpret qualitative and quantitative data to identify patterns, relationships, and insights. Students use mathematical and/or computational methods to analyze data sets and draw conclusions about phenomena or investigations.
- **Inquiry-Based Approaches and Problem Solving** - Students think critically and collaborate to explore real-world problems by asking questions, gathering information, and analyzing data to develop creative solutions that are evidence-based and relevant for the context or situation.
- **Applications and Modeling** - Students use computational, graphical, virtual, mathematical, and/or physical methods to create a representation of a real-world situation in order to describe systems, show relationships, represent data, and test solutions.
- **Information and Digital Literacy** - Students identify information needs, locate relevant information, and evaluate the quality of the source. Students use evaluation strategies to determine the best digital tool(s) for the creation and management of information.

The image below illustrates the interconnected nature of the domains and the notion that integrated STEM is a multi-dimensional experience for students. The domains do not prescribe a specific order in which they must be introduced, but rather work in concert to foster the integration and application of disciplinary content.



Acknowledgments

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Kindergarten Integrated STEM

Communication and Collaboration	
K.CC.1	Collect and document evidence to share information with others in pictures, diagrams, or text.
K.CC.2	Communicate the solution(s) of a problem/analysis either orally, visually, or in writing, which may include process steps, findings, or conclusions.
K.CC.3	Identify roles and responsibilities to collaborate in various group settings (i.e., online, onsite and/or hybrid) and situations.
Data Analysis and Measurement	
K.DM.1	Apply measurements (e.g., time) defined in grade level content standards to analyze real-world scenarios.
K.DM.2	Construct visual representations defined in grade level content standards (e.g., bar graphs) to determine patterns.
K.DM.3	Evaluate reasonableness of observations, results, and solutions throughout processes.
Inquiry-Based Approaches and Problem Solving	
K.IPS.1	Form observations, ask questions, plan and conduct investigations to answer questions or solve problems.
K.IPS.2	Decompose a complex problem into smaller steps or sequences to evaluate (e.g., what should be done first, second) appropriate to grade-level content.
K.IPS.3	Determine one or more viable solutions using data and information to resolve a given scenario.
Applications and Modeling	
K.AM.1	Apply modeling to represent physical or conceptual objects (e.g., plants, animals, base-ten blocks).
K.AM.2	Apply symbols and relationships (e.g., comparisons) to represent physical or conceptual objects (e.g., letters or numbers may represent objects).
K.AM.3	Describe that systems have parts that work together to accomplish a goal (e.g., plant life cycle, computer hardware and software).
Information and Digital Literacy	
K.IDL.1	Consider how technology can both serve as a tool and/or create the problem to be solved.
K.IDL.2	Review and compile information from multiple sources (with teacher support) to solve a problem.